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English TranslationDISC BRAKE, PARTICULARLY FOR A COMMERCIAL VEHICLE

The present invention relates to a disc brake, particularly for a utility vehicle, according to the preamble of Claim 1.

A disc brake of this type is known, for example, from European Patent Document EP 0 534 987 B1. The retaining clamp of this disc brake essentially has the purpose of forming an abutment for springs, in this case, leaf springs, which elastically brace the brake shoes. The retaining clamp is detachable in order to ensure a fast mounting as well as demounting mainly of the brake shoes. The latter takes place, for example, in order to permit access to the brake shoes without any problems which is necessary for a brake pad change.

The fact that the retaining clamp can be attached and removed by means of simple devices also contributes to the above.

For this purpose, the retaining clamp is, on the one side, inserted into a recess of the caliper and is, on the other side, fixedly connected with the caliper, for example, by means of screwing, while bridging an insertion opening for the brake shoes.

The holding device of the caliper for the retaining clamp is

normally situated in an area adjacent to the closing plate and is also made during the casting of the caliper produced as a cast part.

However, for this purpose, measures are required which counteract a simple and economical production of the caliper. Thus, for forming the pocket-shaped holding device, an additional core is required which is to be fitted onto the caliper core, which can naturally be implemented only by means of more manufacturing expenditures.

This circumstance also has special significance from a business management point of view because such disc brakes are produced in large piece numbers in serial production.

It is therefore an object of the present invention to further develop a disc brake of the above-mentioned type such that it has a simpler construction and can be produced and mounted in a more cost-effective manner.

This object is achieved by means of a disc brake which has the characteristics of Claim 1.

This type of disc brake is particularly characterized in

that it can be produced and mounted more economically. Since a caliper-side holding device for the retaining clamp can be eliminated, the production of the caliper as a casting can be carried out more easily, mainly, because no additional core has to be inserted.

On the other hand, a corresponding holding device can be produced without any problems and additional working expenditures in or on the closing plate, the latter being produced from sheet metal as a punched bent part. Naturally, this not only results in a more cost-effective production but also in the avoidance of rejects which can definitely occur during the casting-in of the holding device. Together with the simplification of the casting core, the casting process as a whole is therefore optimized.

Furthermore, by means of the invention, a tolerance range is achieved which is reduced with respect to the positioning precision of the retaining clamp, which tolerance range results in a more accurate fixing of the brake shoes, particularly by the reduction of the spread of the prestressing of the leaf springs, which so far had been possible only by an additional machining.

Another production advantage is the reduction of the machining of the sealing surface of the brake anchor plate with

respect to the closing plate, which contributes as much to a manufacturing-related optimization as the resulting saving of material.

According to an advantageous further development of the invention, it is provided that the form closure of the retaining clamp with the closing plate be achieved such that a holding device is provided in the latter into which the retaining clamp is inserted on the end side. The holding device may be constructed as a slot which in its contour and dimensions corresponds to those of the retaining clamp. In this case, the slot may be punched out in an open manner or be constructed as a pocket which then completely encloses the retaining clamp in the inserted end area.

While, as a result of the pocket-shaped construction of the slot, a sufficient stability of the closing plate exists in this area, in the case of an open slot, it is achieved in that two mutually opposite or surrounding ribs are provided which extend in a bent manner from the surface of the closing plate otherwise in the longitudinal direction of the retaining clamp. Instead of stability-increasing ribs, beads or similar deformations may also be provided.

For the stiffening of the closing plate shaped from the sheet metal, a partially or completely surround rib forming the outer wall may be provided in the form of a bend.

This bend is also meaningful if, according to another idea of the invention, for the form closure, it is shaped in the form of a lug with a wall bounding it on three sides, in which the retaining clamp rests, the fixing of the retaining clamp taking place by the wall bounding the lug, on the one side, and by the assigned leaf spring, on the other side.

In each case, the leaf spring can now be fixed by means of very simple manufacturing measures, that is, by means of a machining requiring few expenditures, specifically only by a corresponding shaping of the closing plate during the punching, for which only the punching tool has to have a corresponding design.

Additional advantageous developments of the invention are characterized in the subclaims.

Embodiments of the invention will be described in the following by means of the attached drawings.

Figure 1 is a perspective view of a partial cutout of a disc brake according to the invention;

Figure 2 is a view of a detail of the disc brake according to Figure 1, viewed in the direction of the arrow II in Figure 1;

Figure 3 is a view also of a perspective partial cutout of another embodiment of a disc brake;

Figure 4 is a view of a detail of the disc brake according to Figure 3, viewed in the direction of the arrow IV in Figure 3.

In Figures 1 and 3, one disc brake respectively is shown in a cutout, particularly for a utility vehicle, which disc brake has a caliper 1 which is closed here by means of a closing plate 2 on a side which faces a brake disc and is not shown. An application device is situated behind the closing plate 2.

Brake shoes, which are also not shown, are held down by means of leaf springs 8 (Figure 3) under spring tension, which, on the other side, are supported on a retaining clamp 3 resting formlocking in the closing plate 2.

For this purpose, the closing plate 2 has a holding device 4

which, in the embodiment according to Figures 1 and 2, consists of a punched-out slot 5 equipped on the top and bottom side with two bent ribs 6 which, however may also be constructed to be surrounding, thus framing the slot 5 and which are used for the reinforcement with respect to increasing the stability.

As indicated very clearly particularly in Figure 1, the retaining clamp 3 is fitted through the slot 5 which, in its rectangular contour, corresponds in the dimension as well as in the shape to the cross-section of the retaining clamp 3. Instead of being provided with the open slot 5, the holding device 4 may be provided with a closed bottom, so that the retaining clamp 3 is inserted with its assigned end area but does not protrude.

In the example illustrated in Figures 3 and 4, the closing plate 2 for the form-locking holding of the retaining clamp 3 has a lug 9 which extends planely with respect to the surface area of the closing plate 2 and which is bounded on three sides by a wall 10 otherwise bent at an angle with respect to the closing plate 2, the retaining clamp 3 resting against it. In this case, the walls 10 form a reinforcement of the closing plate 2, comparable to the ribs 6 in the embodiment according to Figures 1 and 2. In contrast to the retaining clamp 3 used therein, it has slightly shorter dimensions corresponding to Figures 3 and 4 because it

rests maximally against the surface of the closing plate 2.

The walls 10 or the exterior-side boundary of the holding device 4 is continued in ribs 7 which extend on both sides over a partial area on the exterior wall of the closing plate 2 and contribute to an increase of the bending resistance. In this case, the ribs 7 otherwise extend at an angle with respect to the surface of the closing plate 2.

List of Reference Numbers

1	caliper
2	closing plate
3	retaining clamp
4	holding device
5	slot
6	rib
7	rib
8	leaf spring
9	lug
10	wall